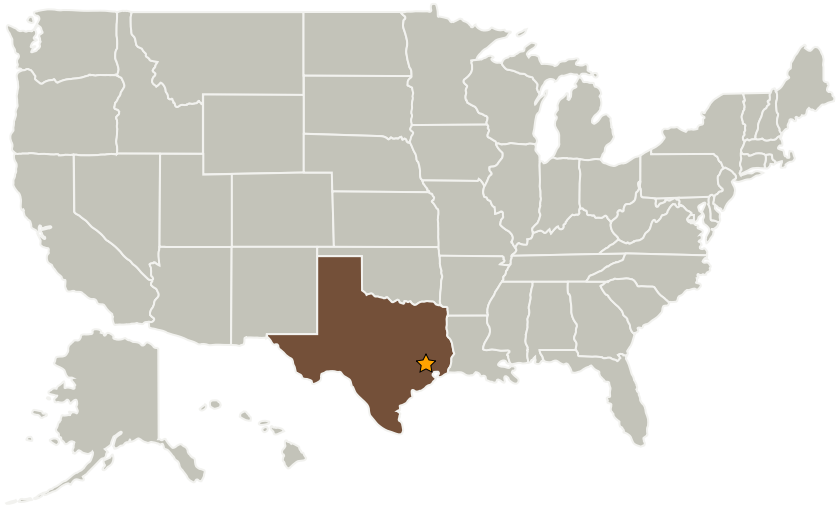
The Constant Force Resistive Exercise Unit (CFREU) for Multi-Functional Exercise, Phase I

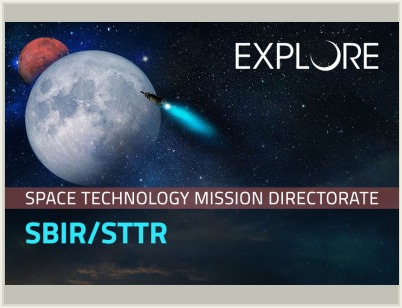
Completed Technology Project (2008 - 2008)

Project Introduction

NASA's vision for future exploration-class missions has made countermeasures for muscle atrophy, bone loss and cardiovascular deconditioning areas of major research design and development within the U.S. space program. Due to restricted volume and mass capabilities within the newly-developing Crew Exploration Vehicle (CEV) and Lunar Surface Access Module (LSAM), there is a need for a multi-functional, compact exercise machine that can incorporate both resistive and aerobic exercise capabilities during lunar sortie missions. The proposed innovation is an exercise device, the multi-functional Constant Force Resistive Exercise Unit (CFREU), that can provide a whole-body workout for aerobic exercise and resistive exercise. The device provides constant force eccentrically and concentrically during multiple exercise configurations, allows resistance selection in 2.5kg increments, requires no power to operate, requires no on-orbit maintenance, and can be stowed in an area of 1 cubic foot. During the Phase I performance period, we propose to develop a prototype of this device and a feasibility assessment of the design for spaceflight and commercial use.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Valeo Human Performance, LLC	Supporting Organization	Industry	Houston, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Paul E Colosky

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.6 Long Duration Health